Honolulu Advertiser
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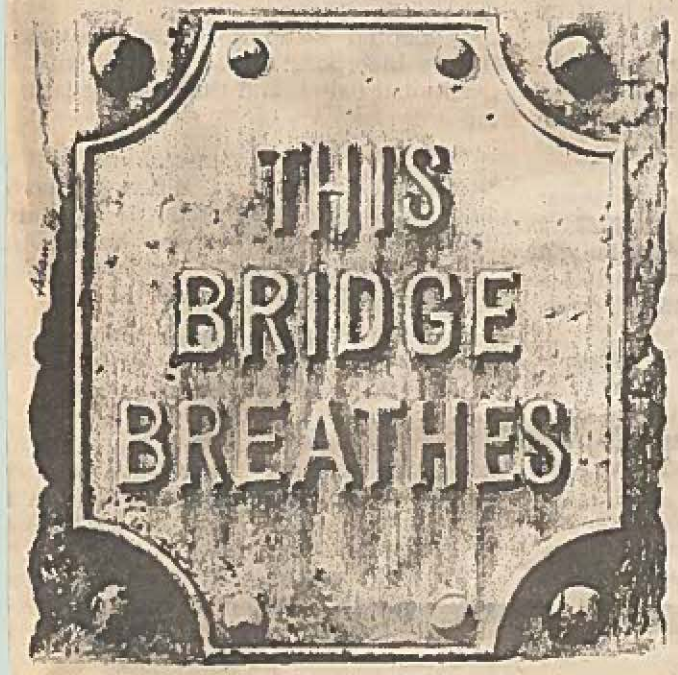


Advertiser photos by Jan TenBruggencate

A state highways welder cuts a piece of metal from the old Pratt Truss of the Hanalei Bridge. The metal is to be tested to determine its strength.

By Jan TenBruggencate
Advertiser Kauai Bureau

HANALEI, Kauai — The Hanalei Bridge lives for Al Lichtenstein.

You can feel its pulse as trucks rumble over its wooden deck, he says. And its bolted joints breathe, like they should.

You might think a bridge is just a stiff structure across a stream, an inanimate form built of rigid materials that just sit there, unmoving as the traffic crosses.

You'd be wrong to think that.

"A truss has all these connections, these elbows and knees and ankles. I like those joints to be bolted rather than welded. I like to see a little movement in a bridge, to let it breathe," Lichtenstein said.

He's been hired, like a doctor, to put his electronic stethoscopes on the bridge, to study its reaction to stress and to recommend ways to get it back in shape.

Lichtenstein

The old structure is actually two bridges. A rusted 1912 Pratt through truss and a late 1960s Warren pony truss. The Warren is wrapped around the lower sides of the Pratt, and partially supports the loads.

They get their proper names from the men who came up with the truss designs. A through truss is one with a top, so you drive through it rather than over it. And a pony truss, said Lichtenstein, is a low truss of the kind used for horse and buggy bridges in the old days.

Abba G. "Al" Lichtenstein, 63, a New Jersey structural engineer with an accent that dates from his youth in Lithuania, specializes in bridges and has done considerable work with historic bridges. He was hired as part of the production of an environmental impact statement the state Department of Transportation wants before it decides what to do with the bridge and the road leading to it from Hanalei town.

"I first saw this bridge 15 years ago. I was on vacation. I even took a picture of it. I was impressed by the fact that it was a double bridge. You don't see that too often," he said.

The Warren Truss was added when state engineers decided the Pratt was no longer strong enough for heavy traffic. Lichtenstein found it an ingenious solution to the problem, but a tricky one. There are those who say the old Pratt is now just dead weight on the Warren. Lichtenstein isn't ready to sign its death warrant.

"I got a good feeling that the old truss is still carrying some of the load. As long as it holds its shape it's taking some of the load," he said.

He tells a reporter to grab a long iron rod that's part of the Pratt. A big car rolls by, and the vibrations are in the steel.

"You feel that? That means the member is alive. It is carrying part of the load. Now feel that one. Not much, see. It's dead.

"Just because the bridge is old, it doesn't have to be declared destructible. Nineteen-twelve to me is a new bridge. I worked with bridges 140 years old," he said.

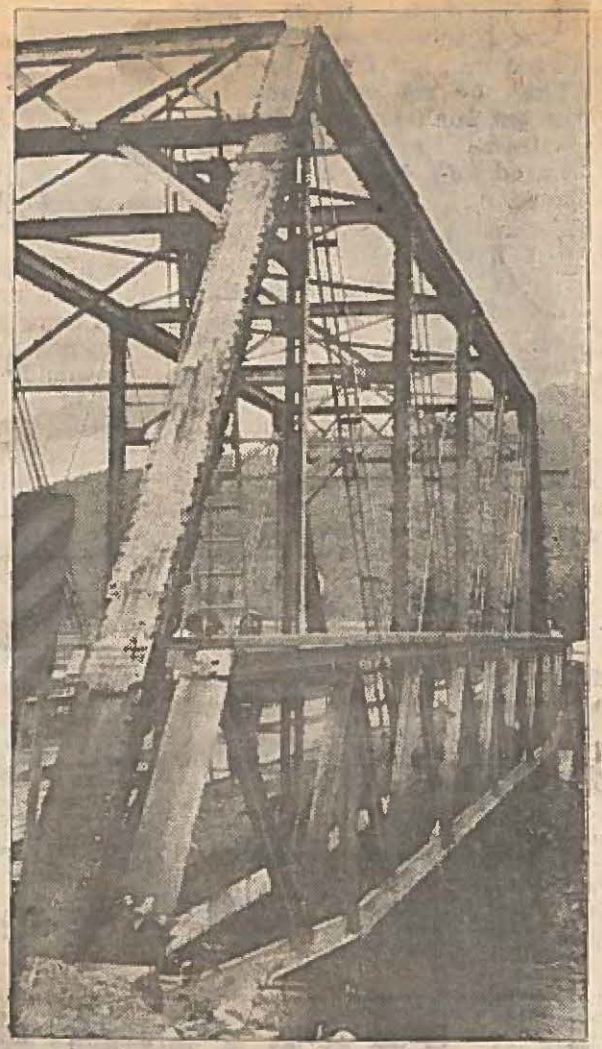
But how much of the load is actually being carried by the Pratt, and how much by the Warren, and what's the capacity of the bridge as a whole? Lichtenstein will study complex engineering data to find that out.

He worked with University of Hawaii civil engineering professor Harold Hamado to attach electronic gauges to the bridge. They closed the bridge and parked a 12-ton truck at critical spots along its 110 feet. They measured the stress in the steel at 30 different places.

"We've got to find out how the loads get from the Pratt to the Warren."

Pieces of the old Pratt's steel were removed for testing, to determine the chemical makeup and strength of the metal.

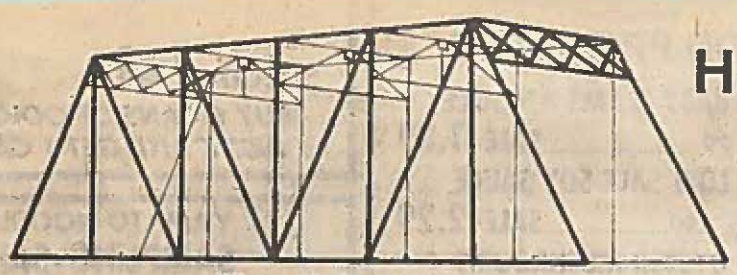
When he's completed the studies, he will prepare a report with the costs and feasibilities of four alternatives for the Hanalei Bridge: stabilizing the bridge at its present, 12-ton load limit; bringing it up to 20 tons; removing the Warren and restoring the Pratt to 20-ton capacity; removing everything and putting a new Pratt, looking like the old one, in its place.



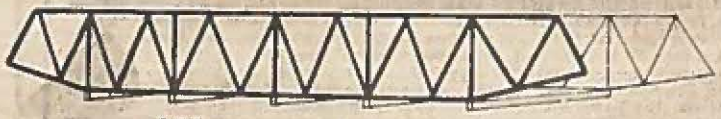
The Hanalei Bridge, built in 1912 by Hamilton & Chambers, New York contractors for steel structures.

State highways Kauai District Engineer Shigeto Yamaguchi said the money for the bridge work is in the state's 1988-89 budget, but a decision on just which of the four alternatives or other bridge schemes will be chosen is still a year or two off. Yamaguchi said the decision will be made after the environmental impact statement is complete and the community has a chance to discuss and make recommendations on the various proposals.

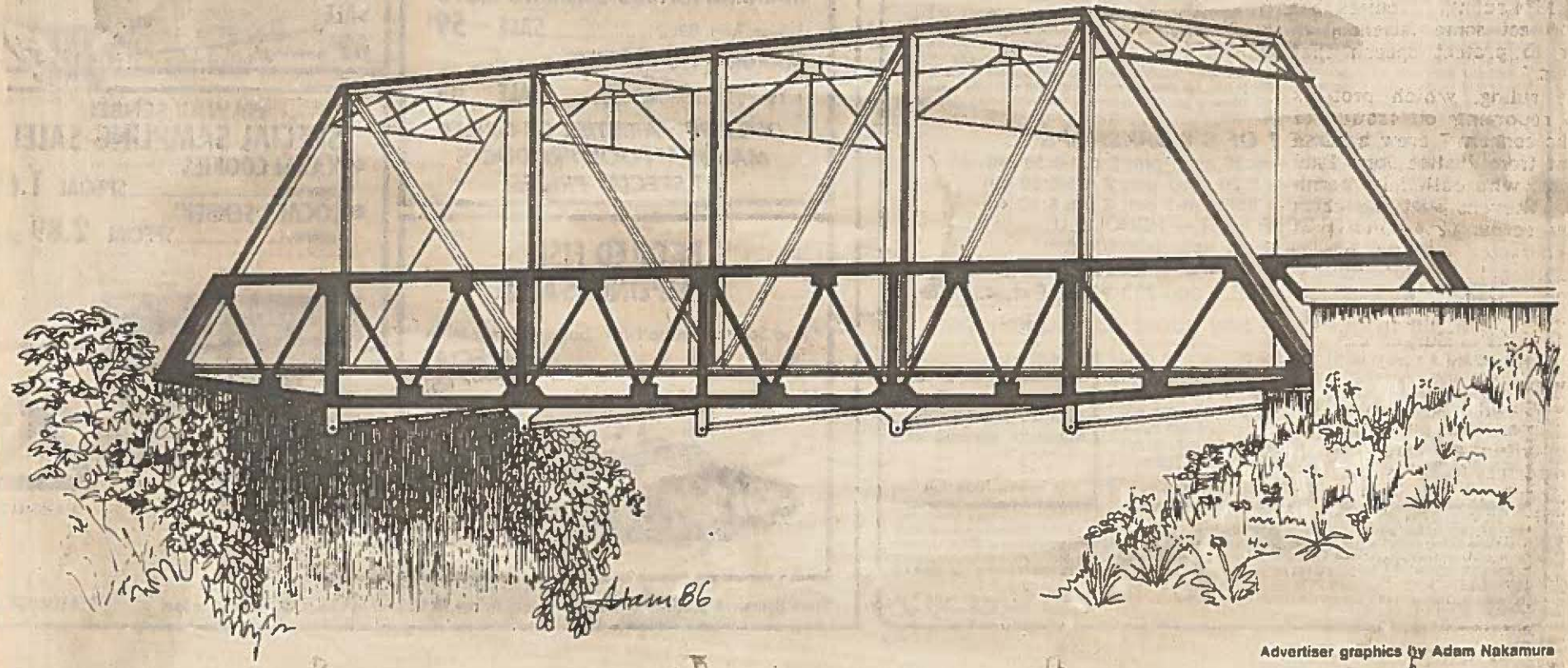
Hanalei Bridge



Pratt truss



Warren truss



Advertiser graphics by Adam Nakamura